

SUPPORT FOR THE AMENDMENT

This Amendment cancels Claims 1-4 and 13; and amends Claims 5 and 7-12. Support for the amendments is found in the specification and claims as originally filed. In particular, support for Claim 5, which is rewritten in independent form, is found in canceled Claim 1. No new matter would be introduced by entry of these amendments.

Upon entry of these amendments, Claims 5-12 will be pending in this application. Claim 5 is independent.

REQUEST FOR RECONSIDERATION

Applicants respectfully request entry of the foregoing and reexamination and reconsideration of the application, as amended, in light of the remarks that follow.

Applicants thank the Examiner for the courtesies extended to their representative during the December 15, 2003, personal interview.

As discussed at the personal interview, conventionally ceramic sheets are made by sintering green sheets stacked between spacers. When the green sheets sinter, they contract and scrape against rough surfaces of the spacers, resulting in the formation of surface flaws and defects in the sintered ceramic sheets.

Applicants have discovered that sintered ceramic sheets having significantly fewer defects than conventional ceramic sheets can be formed by sintering green sheets stacked between **spacers** which comprise **spherical** ceramic particles having an average particle diameter of 0.1 to less than 5 μm as a main component. These spherical ceramic particles in the spacers allow the green sheets to slide easily over the spacers during sintering without forming defects. The specification at Tables 1 and 3, which are reproduced below, shows that ceramic sheets sintered using spacers containing spherical alumina particles (Examples 1, 2 and 3) have significantly fewer sections containing five or more defects than ceramic sheets

sintered using spacers containing alumina particles of no definite form (Comparative Examples 1 and 2).

Table 1

		Example 1	Example 2	Example 3	Comparative Example 1	Comparative Example 2
Green sheet for ceramic sheet	Ceramic powder	8Y-Zirconia	3Y-Zirconia	3Y-Zirconia Alumina	8Y-Zirconia	3Y-Zirconia
	Average particle diameter (μm)	0.22	0.51	Zirconia: 0.6 (sic 0.51) Alumina: 0.8	0.22	0.22 (sic 0.51)
	Particle diameter at 90 vol% (μm)	0.8	1.28	Zirconia: 1.7 (sic 1.28) Alumina: 2.9	0.8	0.8 (sic 1.28)
	Binder (parts)	15	15	14	15	14
	Thickness of green sheet (mm)	0.25	0.13	0.07	0.25	0.25 (sic 0.13)
	Size after baking (mm) One side \times thickness	100 \times 0.2	100 \times 0.1	120 \times 0.05	100 \times 0.2	100 \times 0.1
Spacer sheet-cover sheet	Kind of sheet (rate of porosity)	Green sheet	Calcined sheet (25%)	Calcined sheet (22%)	Green sheet	Calcined sheet (35%)
	Ceramic powder	Spherical alumina of Nippon Shokubai Co., Ltd.	Spherical alumina of Nippon Shokubai Co., Ltd.	Spherical alumina of Nippon Shokubai Co., Ltd. (90%) 3Y-Zirconia (10%)	No definite form alumina of Showa Denko Co., Ltd.	No definite form alumina of Showa Denko Co., Ltd.
	Average particle diameter (μm)	0.7	0.7	Alumina: 0.8 Zirconia: 0.51	55	0.7 (sic 0.55)
	Thickness of spacer sheet (mm)	0.15	0.13	0.15	0.15	0.13
	Thickness of cover sheet (mm)	0.2	0.27	0.3	0.2	0.27

Table 3

	Example 1	Example 2	Example 3	Comparative Example 1	Comparative Example 2
Number of sections having 5 or more defects	0	0	0	4	3
Bending strength (kgf/mm ²)	24	69	84	18	55
Weibull modulus	13	15	11	8	7
Numbers of sheets having checks and cracks (pieces)	3	1	2	7	6

Claims 1, 3, 5-7 and 9-12 are rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 5,057,360 ("Osaka"). In addition, Claims 1-10 and 13 are rejected under 35 U.S.C. § 103(a) over JP 8151270 ("Kazuo-270"). Claims 1-10 are rejected under 35 U.S.C. § 103(a) over JP 8151271 ("Kazuo-271").

Osaka discloses that a ceramic sheet containing spherical particles can be formed by "calcining a green sheet in a flat state or a formed state by the conventional method". Osaka at column 8, lines 28-31; column 3, lines 43-51.

However, Osaka is silent about sintering green sheets between spacers, and is silent about spacers containing spherical ceramic particles.

Kazuo-270 and Kazuo-271 disclose sintering green sheets placed on or between porous sheets.

However, Kazuo-270 and Kazuo-271 fail to suggest that the porous sheets include spherical ceramic particles.

Thus, the cited prior art fails to suggest the independent Claim 5 limitations of "sandwiching a first green sheet between spacers; baking the first green sheet while the first green sheet is sandwiched between the spacers; and producing a ceramic sheet having not more than 5 defects in an area of 900 mm² from the first green sheet, wherein each of the **spacers** is a either a second green sheet or a calcined sheet each **comprising spherical ceramic particles having an average particle diameter of 0.1 to less than 5 μm as a main component**".

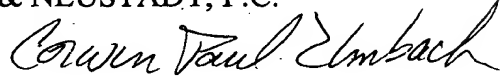
Because the cited prior art fails to suggest all the limitations of the claimed invention, the rejections under 35 U.S.C. § 103(a) should be withdrawn.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the application is in condition for allowance. Applicants respectfully request favorable consideration and prompt allowance of the application.

Should the Examiner believe that anything further is necessary in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants and the assigned attorney at the telephone number listed below.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Norman F. Oblon
Attorney of Record
Registration No. 24,618

Corwin P. Umbach, Ph.D.
Registration No. 40,211

Customer Number

22850

(703) 413-3000

Fax #: (703) 413-2220

NFO/CPU:sjh